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Indian Standard

ELECTROMAGNETIC COMPATIBILITY (EMC)

PART 6 GENERIC STANDARDS

Section 3 Emission Standard for Residential, Commercial and Light-Industrial Environments

ICS 33.100.20

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

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Electromagnetic Compatibility Sectional Committee, LTD 22

NATIONAL FOREWORD

This Indian Standard which is identical with CISPR/IEC 1000-6-3 (1996) 'Electromagnetic compatibility (EMC) — Part 6 : Generic standards — Section 3: Emission standard for residential, commercial and light-industrial environments' issued by the International Special Committee on Radio Interference (CISPR) was adopted by the Bureau of Indian Standards on the recommendation of the Electromagnetic Compatibility Sectional Committee and approval of the Electronics and Telecommunication Division Council.

In the adopted standard, certain conventions are not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

CROSS REFERENCES

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards which are to be substituted in their place are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
IEC 50(161):(1990) International Electrotechnical Vocabulary (IEV) — Chapter 161:Electromagnetic compatibility	IS 1885 (Part 64/Sec 1 and 2):1987 Electrotechnical vocabulary: Part 64 Electromagnetic compatibility, Section 1 General terms, Section 2 Specific terms	Technically Equivalent
IEC 61000-3-2:1995 Electromagnetic compatibility (EMC) — Part 3:Limits — Section 2: Limits for harmonic current emissions (equipment input ≤ 16 A per phase)	IS 14700 (Part 3/Sec 2):1999 Electromagnetic compatibility: Part 3 Limits, Section 2 Limits for harmonic current emissions (equipment input current = < 16 A per phase)	Identical
IEC 61000-3-3:1994 Electromagnetic compatibility (EMC) — Part 3:Limits — Section 3: Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current ≤ 16 A	IS 14700 (Part 3/Sec 3):1999 Electromagnetic compatibility (EMC): Part 3 Limits, Section 3 Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current ≤ 16 A	do
CISPR 14:1993 Limits and methods of measurement of radio disturbance characteristics of electric motor-operated and thermal appliances for household and similar purposes, electric tools and similar electric apparatus	IS 6873 (Part 2):1999 Limits and methods of measurements of radio disturbance characteristics: Part 2 Electrical motor-operated and thermal appliances for household and similar purpose, electrical tools and electric apparatus (*first revision*)	do
CISPR 22:1997 Information technology equipment — Radio disturbance characteristics — Limits and methods of measurement	IS 6873 (Part 7):1999 Limits and methods of measurements of radio disturbance characteristics : Part 7 Information technology equipment (*first revision*)	do

Only the English language text of the International Standard has been retained while adopting it in this Indian Standard.

IS 14700 (Part 6/Sec 3) : 2002
CISPR/IEC 1000-6-3 (1996)

Indian Standard

ELECTROMAGNETIC COMPATIBILITY (EMC)

PART 6 GENERIC STANDARDS

Section 3 Emission Standard for Residential, Commercial and Light-Industrial Environments

1 Scope

This International Standard for emission requirements applies to electrical and electronic apparatus intended for use in the residential, commercial and light-industrial environment, as described in clause 5, for which no dedicated product or product-family emission standard exists. Apparatus designed to radiate electromagnetic energy for radio communication purposes is excluded from this standard.

Disturbances in the frequency range 0 Hz to 400 GHz are covered.

Where a relevant dedicated product or product-family EMC emission standard exists, this shall take precedence over all aspects of this generic standard.

The emission requirements have been selected so as to ensure that disturbances generated by apparatus operating normally at residential, commercial and light-industrial locations do not exceed a level which could prevent other apparatus from operating as intended. Fault conditions of apparatus are not taken into account.

Apparatus installed in the locations covered by this standard are considered to be directly connected to low-voltage public mains supplies or to a dedicated d.c. source which is intended to interface between the apparatus and the low-voltage public mains supply. Apparatus intended to be connected to an industrial power network or to special power supply sources are covered by another generic standard.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 50(161): 1990, *International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility*

IEC 1000-3-2: 1995, *Electromagnetic compatibility (EMC) – Part 3: Limits – Section 2: Limits for harmonic current emissions (equipment input current ≤16 A per phase)*

IEC 1000-3-3: 1994, *Electromagnetic compatibility (EMC) – Part 3: Limits – Section 3: Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current ≤16 A*

CISPR 14: 1993, *Limits and methods of measurement of radio disturbance characteristics of electric motor-operated and thermal appliances for household and similar purposes, electric tools and similar electric apparatus*

CISPR 22: 1993, *Limits and methods of measurement radio disturbance characteristics of information technology equipment*
Amendment 1 (1995)

3 Objective

The objective of this standard is to define limits and test methods for apparatus defined in the scope, in relation to electromagnetic emissions which may cause interference in other apparatus e.g. radio receivers.

These emission limits represent essential electromagnetic compatibility requirements.

Test requirements are specified for each port considered.

NOTES

1 The limits in this standard may not, however, provide full protection against interference to radio and television reception when the apparatus is used closer than 10 m to the receiving antenna(e).

2 In special cases, for instance when highly susceptible apparatus is being used in proximity, additional mitigation measures may have to be employed to reduce the electromagnetic emission further below the specified levels.

4 Definitions

Definitions related to EMC and to relevant phenomena may be found in the EEC Directive, in IEC 50(161) and in IEC and CISPR publications. The definitions stated in the Directive (89/336/EEC) take precedence.

The following particular definitions are used in this standard:

port: Particular interface of the specified apparatus with the external electromagnetic environment (see figure 1).

enclosure port: The physical boundary of the apparatus through which electromagnetic fields may radiate or impinge.

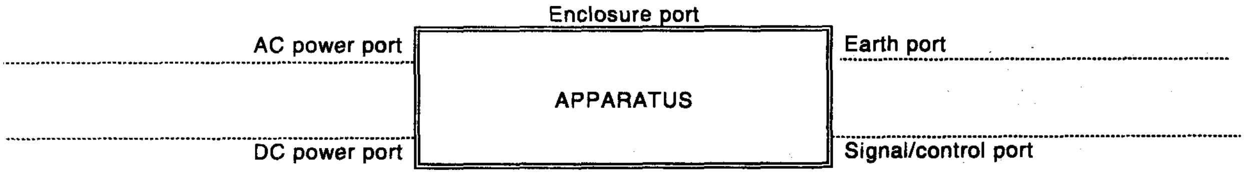

Figure 1 – Examples of ports

5 Description of locations

The environments encompassed by this standard are residential, commercial and light-industrial locations, both indoor and outdoor. The following list, although not comprehensive, gives an indication of locations which are included:

- residential properties, e.g. houses, apartments, etc.;
- retail outlets, e.g. shops, supermarkets, etc.;
- business premises, e.g. offices, banks, etc.;
- areas of public entertainment, e.g. cinemas, public bars, dance halls, etc.;
- outdoor locations, e.g. petrol stations, car parks, amusement and sports centre, etc.;
- light-industrial locations, e.g. workshops, laboratories, service centres, etc.

Locations which are characterized by being supplied directly at low voltage from the public mains are considered to be residential, commercial or light industrial.

6 Conditions during measurement

The measurements shall be made in the operating mode producing the largest emission in the frequency band being investigated consistent with normal applications.

An attempt shall be made to maximize the emission by varying the configuration of the test sample.

If the apparatus is part of a system, or can be connected to auxiliary apparatus, then the apparatus shall be tested while connected to the minimum configuration of auxiliary apparatus necessary to exercise the ports in accordance with CISPR 22.

The configuration and mode of operation during measurement shall be precisely noted in the test report.

If the apparatus has a large number of terminals, then a sufficient number shall be selected to simulate actual operating conditions and to ensure that all the different types of termination are covered.

The tests shall be carried out somewhere within the specified operating environmental range for the apparatus and at its rated supply voltage, unless otherwise indicated in the basic standard.

7 Documentation for the purchaser/user

7.1 *Documentation which shall be supplied to the purchaser/user*

The purchaser/user shall be informed if special measures have to be taken to achieve compliance, e.g. the use of shielded or special cables.

7.2 *Documentation which shall be available to the purchaser/user upon request*

A list of auxiliary apparatuses which, together with the apparatus, comply with the emission requirements shall be made available.

8 Applicability

Measurements are made on the relevant ports of the apparatus according to table 1. Measurements shall only be carried out where the relevant ports exists.

It may be determined from consideration of the electrical characteristics and usage of a particular apparatus that some of the measurements are inappropriate and therefore unnecessary. In such a case it is required that the decision not to measure be recorded in the test report.

9 Emission limits

The emission limits for apparatus covered by this standard are given on a port-by-port basis.

Measurements shall be performed in well-defined and reproducible conditions for each type of disturbance.

The description of the test, the test methods, and the test set-up are given in basic standards which are referred to in table 1 and in table A.1.

The contents of these basic standards are not repeated here; however, modifications or additional information needed for the practical application of the tests are given in this standard.

NOTE – The term "basic standard" has been used for want of a more suitable term. The standards referenced (CISPR 14, CISPR 22, IEC 1000-3-2 and IEC 1000-3-3) are stand-alone product-family standards. The reference to "basic standards" is intended to be limited to those parts of the standard that give the description of the test, the test methods and the test set-up.

Table 1 – Emission

Port	Frequency range	Limits	Basic standard	Applicability note	Remarks
Enclosure	30 MHz – 230 MHz 230 MHz – 1000 MHz	30 dB(μV/m) at 10 m 37 dB(μV/m) at 10 m	CISPR 22, Class B	See note 1	The statistical evaluation in the basic standard applies
AC mains	0 kHz – 2 kHz		IEC 1000-3-2 IEC 1000-3-3	See note 2	
	0,15 MHz – 0,5 MHz limits decrease linearly with log. frequency	66 dB(μV) – 56 dB(μV) quasi-peak 56 dB(μV) – 46 dB(μV) average	CISPR 22, Class B		The statistical evaluation in the basic standard applies
	0,5 MHz – 5 MHz	56 dB(μV) quasi-peak 46 dB(μV) average			
	5 MHz – 30 MHz	60 dB(μV) quasi-peak 50 dB(μV) average			
	0,15 MHz – 30 MHz	See basic standard, clause: discontinuous interference	CISPR 14		

NOTES

1 Applicable only for apparatus containing processing devices, e.g. microprocessors, operating at frequencies greater than 9 kHz.

2 Applicable to apparatus covered within the scope of IEC 1000-3-2 and IEC 1000-3-3. Limits for apparatus not currently covered by IEC 1000-3-2 and IEC 1000-3-3 are under consideration.

Annex A
(informative)

The purpose of this informative annex is to indicate tests which may be proposed for inclusion in this standard when the relevant basic standards are published. The data in the following table is for guidance only and will be reviewed when the relevant basic standard is published.

Table A.1 – Emission

Port	Frequency range	Limits	Basic standard	Applicability note	Remarks
Signal, control, d.c. power input, d.c. power output and other	0,15 MHz – 0,5 MHz Limit decreasing linearly with log. frequency	40 dB(μA) – 30 dB(μA) quasi-peak 30 dB(μA) – 20 dB(μA) average	CISPR 22 Amend. 1, Class B		Current probe measurement with line terminated to reference plane via 150 Ω
	0,5 MHz – 30 MHz	30 dB(μA) quasi-peak 20 dB(μA) average			

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

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